FEDERAL AID IN FISH RESTORATION
STUDY G-I

INVENTORY AND CATALOGING

By: F.D. Van Hulle, J.B. Murray, S.L. Hammarstrom, D.A. Watsjold, L.A. Gwartney, F.T. Williams, S.W. Kubik and J.C. Riis

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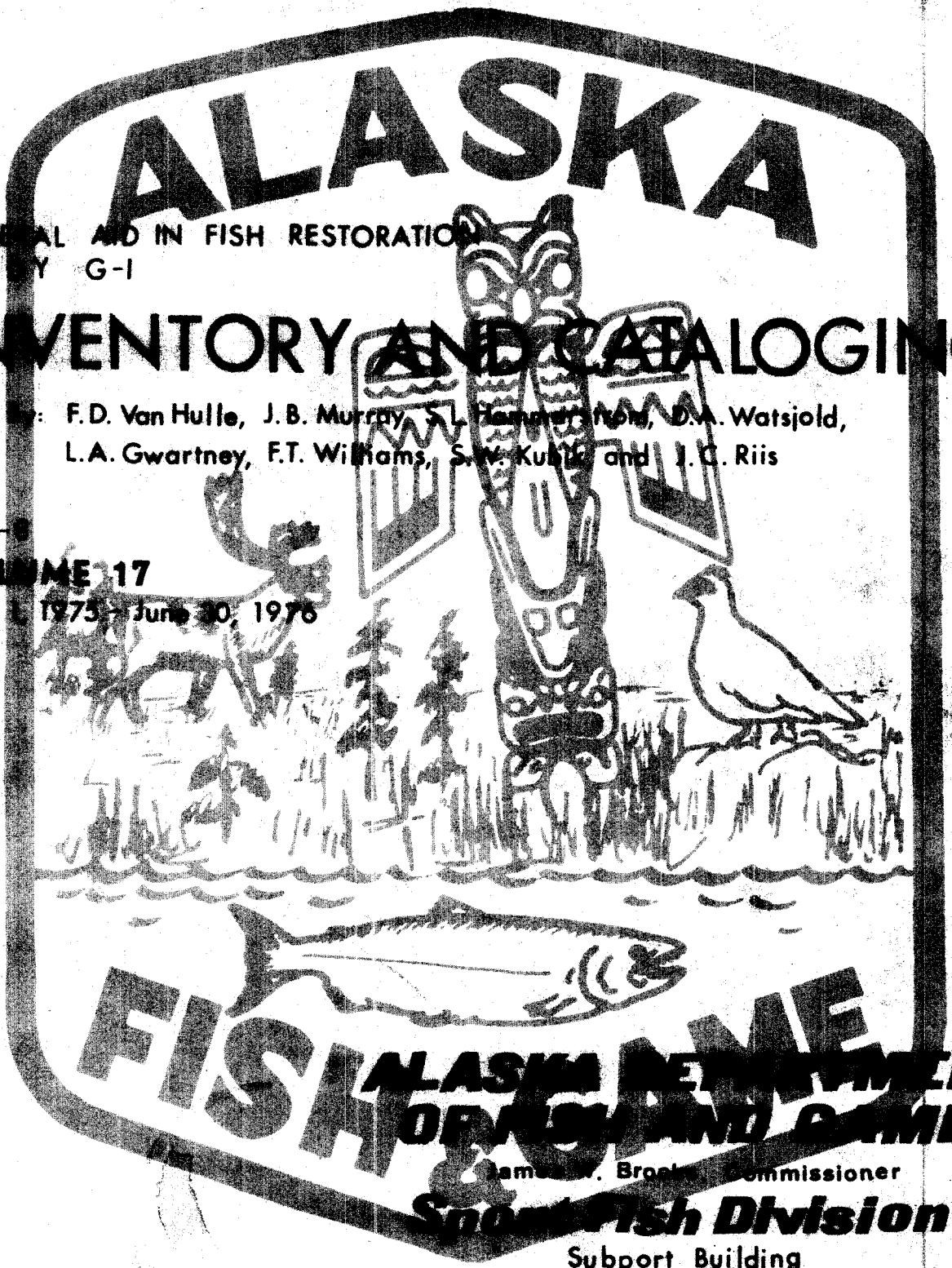

ALASKA DEPARTMENT OF FISH AND GAME
James W. Brooks, Commissioner
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JUNEAU, ALASKA

Volume 17

STUDY G-1

STATE OF ALASKA

Jay S. Hammond, Governor

Annual Performance Report for

INVENTORY AND CATALOGING

by

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James W. Brooks, Commissioner

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RESEARCH PROJECT SEGMENT

State:	ALASKA	Name:	Sport Fish Investigations of Alaska.
Project No.:	F-9-8		
Study No.:	G-I	Study Title:	INVENTORY AND CATALOGING
Job No.:	G-I-F	Job Title:	Inventory and Cataloging of Sport Fish and Sport Fish Waters of the Copper River, Prince William Sound and the Upper Susitna River Drainages.

Period Covered: July 1, 1975 to June 30, 1976.

ABSTRACT

Fourteen managed lakes were test netted to determine survival and condition of experimentally stocked fish and the status of native fish stocks. Six lakes, previously unsurveyed, were sampled with gill nets for fish population analysis.

Creel census of fishermen on the Gulkana River revealed an estimated 2,734 anglers fished 13,171 hours and caught 697 chinook, Oncorhynchus tshawytscha (Walbaum), and sockeye, O. nerka (Walbaum), salmon.

During salmon escapement surveys conducted in 1975 of streams tributary to Valdez Bay 58,707 pink salmon, O. gorbuscha (Walbaum), were enumerated.

Five hundred and twenty-eight Arctic grayling, Thymallus arcticus (Pallas), were captured and tagged at Poplar Grove Creek to determine migrational patterns. Forty-one (8%) of these fish were later caught by anglers. One tagged grayling was recaptured 79 miles upstream from the tagging site.

Length and maturity data were collected from 57 burbot, Lota lota (Linnaeus), caught in Hudson Lake, located 16 miles south of Glennallen. The youngest fish taken was age VI and the average was age X, indicating a mature population and very little recruitment.

A standpipe outlet structure was installed at Tex Smith Lake to prevent the out-migration of salmonids. This structure functioned successfully throughout the year, proved relatively maintenance free, and required no cleaning. This is a new outlet structure design for Alaska and may have application in other areas of the state.

BACKGROUND

The Glennallen area is typical of many within the state in that recreational angling opportunity is provided by a number of anadromous species and both indigenous and stocked lake and stream resident species.

The stream dwelling species most often taken by sport anglers are Arctic grayling, chinook, and sockeye salmon.

The principal lake dwelling species caught by recreational anglers in the Glennallen area are the indigenous burbot and introduced coho salmon and rainbow trout.

The community of Glennallen is one typical of many in Alaska, currently undergoing marked increases in human population as a result of Trans-Alaska pipeline construction. Increases in recreational utilization of the salmon and freshwater species of the area have been substantial, requiring greater management effort and in some cases more restrictive angling regulations.

Activities reported in the following text are directed toward the research and management needs of these species, and the attainment of desirable levels of angler utilization.

RECOMMENDATIONS

1. Continue tagging grayling in Poplar Grove Creek to determine migration patterns.

2. Continue the study of anadromous fish stocks in the upper Copper River Drainage and Prince William Sound to determine timing and magnitude of runs.

3. Continue the assessment of the efficiency of an outlet control structure at Tex Smith Lake.

4. Continue the monitoring of road and bridge construction, pipeline construction, and other land uses to afford maximum protection to the fishery resource and habitat.

5. Continue the evaluation of experimental fish stocking.

6. Continue cataloging and inventory surveys on a limited basis as required.

OBJECTIVES

1. To determine the environmental characteristics of the existing and potential recreational fishing waters of the job area, and where practical, obtain estimates of the sport fish harvest and angler participation rates.

2. To assist in determining the current status of public access to the recreational fishing waters within the job area, and to make recommendations for selection of recreational fishing access sites.

3. To determine stocking measures, formulate recommendations for the management of area waters, and direct the course of future studies.

4. To determine the magnitude of various fish stocks and develop plans for their enhancement.

5. To determine the effects of proposed construction programs on fisheries and fisheries environments.

TECHNIQUES USED

Standard techniques described by Williams (1971) were used in lake and stream surveys, and for collection of fish samples. Each test netting was conducted for a minimum of 16 hours, including an overnight period. Grayling were tagged with numbered Floy anchor tags. Stream surveys (salmon enumerations) were made from aircraft and on foot. All measurements of fish length were from snout to fork of tail.

During a creel census on the Gulkana River the fishing day was determined to be between the hours of 8 a.m. and midnight, and was further divided into four four-hour periods. Weekend days and holidays were each censused for two randomly chosen four-hour periods, and four randomly chosen weekdays per week were censused for one randomly selected four-hour period. All weekend days, holidays, and approximately 83% of the weekdays were censused.

The river was divided into three sections based on accessibility. These sections were (1) lower, from the mouth upstream two miles, (2) middle, in the vicinity of the Richardson Highway bridge, and (3) upper, (Sourdough) from the mouth of Sourdough Creek upstream to the West Fork of the Gulkana River.

Fishermen and boats were aerially enumerated in conjunction with ground angler checks and boat and automobile counts. Harvest and effort were calculated by methods described by Neuhold and Lu (1957).

FINDINGS

Results

Population Sampling, Managed Lakes:

Test netting was conducted on 14 managed lakes in the upper Copper River drainage during 1975 and the results shown in Table 1.

Peanut and Forty Foot lakes, near Lake Louise, were test netted to determine the survival of coho salmon, Oncorhynchus kisutch (Walbaum), stocked in 1973. Twelve coho salmon were taken from Peanut Lake that ranged from 226-293 mm fork length and averaged 259 mm. Arctic grayling, Thymallus arcticus (Pallas), were the only fish taken from Forty Foot Lake, and it is suspected that the coho salmon stocked in 1973 migrated out the small outlet.

Caribou and Elbow lakes, on the Lake Louise road, were rehabilitated in 1971 and restocked with coho salmon in 1972, 1973, and 1974. Test netting in 1973 and 1974 (Williams, 1974, 1975) resulted in the capture of yearling coho salmon, indicating an out-migration in their second year of life. In 1974 the swamp-type outlets of both lakes were screened in an effort to prevent this out-migration. Test netting in 1974 produced four coho salmon from Elbow Lake that ranged from 110-115 mm in fork length. One coho salmon, measuring 108 mm fork length, was taken from Caribou Lake. It is apparent that screening the outlet area was not successful in preventing out-migration of coho salmon. No further stocking is contemplated until adequate outlet structures can be developed and installed in these two lakes.

Bearcub Lake, adjacent to the Tok Highway, was stocked in 1974 with coho salmon. Test netting in 1975 produced 53 coho salmon ranging in fork length from 188 to 283 mm and averaging 235 mm.

Crater Lake was test netted in 1975. A total of nine coho salmon stocked in 1973 were captured ranging from 290-357 mm fork length and averaging 333 mm.

Dick Lake, on the Richardson Highway, was test netted and 12 grayling taken. These fish ranged from 150-392 mm in fork length and averaged 251 mm. Although there is no inlet or outlet, and there are no obvious spawning areas in the lake, some of the grayling were a result of natural reproduction, as no grayling have been stocked in this lake since 1969.

Test netting of Moose Lake, located at Mile 170 Glenn Highway, resulted in a catch of 115 grayling that averaged 250 mm fork length and ranged from 114-395 mm. The grayling averaged almost the same fork length as those

Table 1. Gill Net Summary - Managed Lakes, Upper Copper River Drainage, 1975.

Name	Location	Number of fish	Species	Length Range (mm)	Mean Length (mm)	Frequency**	Percent Composition
Arizona	T8N R7W S11	8	GR	100-300		0.40	100
Bearcub	T12N R9E S29	10	WF	162-273	210	0.42	15
		4	SK	198-217	211	0.17	6
		53	SS	188-283	235	2.20	79
Buffalo	T3N R7W S2	3	RB	238-309	262	0.06	100
Caribou	T5N R7W S16	1	SS		108	0.05	100
Crater	T4N R6W S29	1	RB		492	0.02	10
(Lk. Louise)		9	SS	290-357	333	0.20	90
Dick	T13N R1W S31	12	GR	150-392	251	0.26	100
Elbow	T5N R7W S22	4	SS	110-115	113	0.22	100
Moose	T4N R5W S13	115	GR	114-395	250	3.19	64
		64	SK			1.80	36
Tolsona	T4W R5W S24	106	GR	101-410	220	2.25	19
		466	SK			11.10	81
Thompson	T85 R3W S26	13	GR	204-220	213	0.33	76
		4	RB	265-284	271	0.10	24
Forty Foot	T4N R7W S16	22	GR	192-322	241	1.10	100
Peanut	T4N R7W S16	12	SS	226-293	259	0.60	100
Kettle	T9N R11E S18	1	SK		381		100
Meiers	T12N R1W S18	23	GR	228-460	273	0.57	96
		1	BB		182	0.03	4

* GR - Grayling
WF - Whitefish
SK - Suckers
SS - Coho salmon
RB - Rainbow Trout
BB - Burbot

** Frequency is number of fish per net hour.

taken in 1974, which was 247 mm, but the net frequency declined from 5.54 to 3.19 fish per hour. The net frequency for longnose suckers, Catostomus catostomus (Forester), also dropped from 3.63 fish per hour in 1974 to 1.8 in 1975. The reduction in grayling per hour may have been because the lake was not stocked in 1974. However, a net catch of 3.19 grayling per hour indicates an adequate fish population and additional annual stocking does not appear necessary.

Thompson Lake, located near Valdez, has been stocked with rainbow trout, Salmo gairdneri (Richardson), since the late 1950's. This lake has a history of occasional winter kills due to low dissolved oxygen concentrations. In 1974 grayling were stocked in Thompson Lake because of their greater ability to survive under adverse winter conditions. Test nets fished in 1975 caught grayling that ranged in fork length from 204-220 mm and averaged 213 mm. Grayling will be stocked again in this lake as they appear to survive better than rainbow trout.

Test netting was conducted again in 1975 at Tolsona Lake located at Mile 170 Glenn Highway and grayling were taken at a rate of 2.25 per net hour. These grayling ranged in fork length from 101-410 mm and averaged 220 mm. Longnose suckers were caught at a rate of 11.1 per net hour, a much higher frequency than recorded previously.

Population Sampling - New Lakes:

In 1975, six previously unsurveyed lakes were test netted to determine fish species present and their relative abundance. These data are presented in Tables 2 and 3.

Gulkana River Creel Census:

During the summer of 1975 a creel census was conducted of recreational salmon anglers fishing the Gulkana River. The estimated sport fish harvest and effort is presented in Table 4. The catch per angler hour for chinook salmon, O. tshawyscha (Walbaum), was higher in the upper section (.096) than in the lower (.014) and middle (.014) sections (Figure 1). The chinook salmon migrated through the lower and middle sections when the water was high and muddy, and angler success was relatively low. By the time the fish arrived at the upper river section the water had cleared, resulting in a greater harvest.

A new regulation pertaining to the Gulkana River was inaugurated in 1975 which permitted fishing in the lower and middle sections with flies only, further contributing to the small catch of chinook salmon. The intent of the new "flies-only" regulation pertaining to the lower Gulkana River is (1) to limit the harvest of chinook salmon at the confluence with the Copper River, an area of periodic fish concentration, and (2) to provide an angling method which continues to allow a sport harvest of sockeye salmon, O. nerka (Walbaum).

The 1975 catch of sockeye salmon from the Gulkana River was very poor (.004 fish per angler hour) and can be attributed to two factors: (1) the 1975

Table 2. Gill Net Summaries, Previously Unsurveyed Lakes, Copper River Drainage, 1975.

Name	Location	Number of Fish	Species*	Length Range (mm)	Mean Length (mm)	Frequency**	Percent Composition
Keg	T11N R6W S23	5	SK	420-450	442	0.11	7
		62	WF	90-430	249	0.14	84
		7	LT	445-635	553	0.15	9
Reka	T3N R10W S7	37	GR	119-262	204	0.77	35
		46	WF	158-305	220	0.96	43
		22	SK	295-440	385	0.46	21
		1	BB		440	0.02	1
Scenic Lake #1	T85 R2W S3	0	0				
Scenic Lake #2	T85 R2W S4	0	0				
Grass	T16S R2E S27	1	GR		213	0.02	100
Long Island	T16S R2E S22	0	0				

* SK - Suckers
WF - Whitefish
LT - Lake Trout
GR - Grayling
BB - Burbot

** Frequency is the number of fish per net hour.

Table 3. Physical and Biological Data from Previously Unsurveyed Lakes in the Copper River Drainage, 1975.

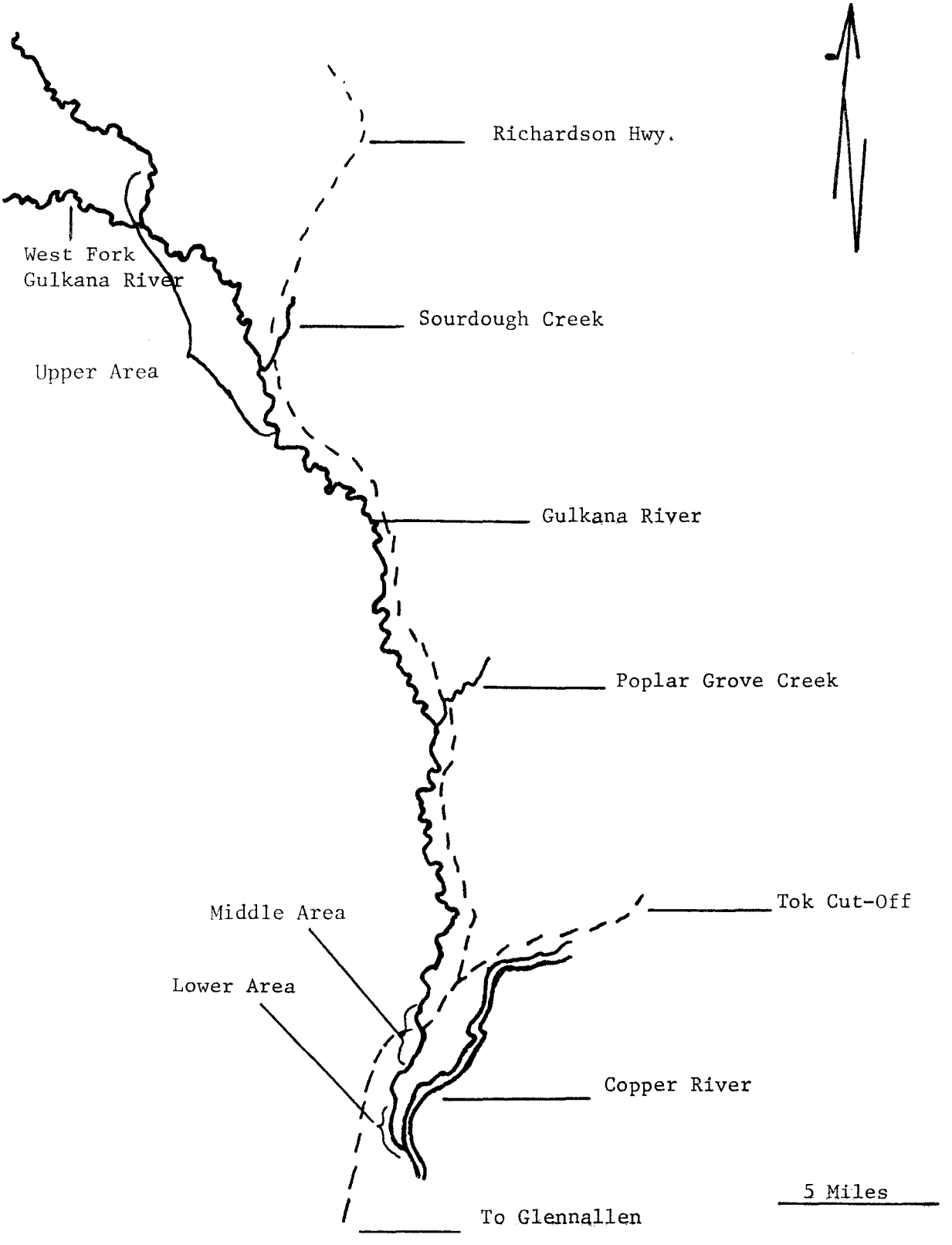
Lake	Surface Area Acres	Maximum Depth (ft)	Percent of Shoal Area	Fish Species* Present	Location by Bay or Drainage
Keg	240	36	50	LT, WF, SK	West Fork Gulkana River Gulkana River
Reka	170	30	50	GR, BB, WF, SK	Little Nelchina River Nelchina River
Scenic Lake #1	15	10	100	None	Tsaina River
Scenic Lake #2	15	15	100	None	Tsaina River
Grass	12	9	100	None	Lower Copper River
Long Island	2	10	100	None	Lower Copper River

*LT - Lake Trout
GR - Grayling
BB - Burbot
WF - Whitefish
SK - Sucker

Table 4. Gulkana River Estimated Sport Harvest and Effort, 1975.

	Lower Section (6/14-7/13)	Middle Section (6/14-7/13)	Upper Section (7/4-8/1)	Total (6/14-8/1)
Number of Anglers	639	803	1,292	2,734
Number of Hours	3,112	3,771	6,288	13,171
Hours Fished Per Angler	4.87	4.70	4.87	4.82
Angler Catch				
Chinook Salmon	43	52	602	697
Sockeye Salmon	15	19	13	47
Total Salmon	58	71	615	744
Catch Per Angler				
Chinook Salmon	0.067	0.065	0.466	0.255
Sockeye Salmon	0.023	0.024	0.010	0.017
Total Salmon	0.090	0.089	0.476	0.272
Catch Per Hour				
Chinook Salmon	0.014	0.014	0.096	0.053
Sockeye Salmon	0.005	0.005	0.002	0.004
Total Salmon	0.019	0.019	0.098	0.057

Figure 1 . Gulkana River Creel Census Areas.



escapement of sockeye salmon into the Gulkana River system was the lowest in 12 years and, (2) a new regulation was adopted in 1975 which made it illegal to snag fish.

Prior to 1975 snagging was the most common method of catching sockeye salmon. It is estimated that the number of sockeye salmon fishermen in 1975 was 50% less than in 1974 as a result of this new regulation.

Anglers checked in the 1975 Gulkana River creel census came from 11 different Alaskan communities, 19 other states, and two foreign countries. Ninety-one percent of the anglers were from Alaska with Anchorage (55%) and Fairbanks (21%) contributing the largest numbers.

Chinook Salmon - Gulkana River:

During the 1975 creel census conducted on the Gulkana River length measurements and scales were taken from 93 chinook salmon. A comparison of lengths of chinook salmon from the Gulkana River since 1972 is given in Table 5.

Table 6 gives length-age data from chinook salmon taken from the Gulkana River. In 1975 age 1.3 and age 1.4 represented 62% and 35%, respectively, of the total fish sampled, while in 1973 age 1.3 fish represented 52% and age 1.4 fish represented 48% of the total.

Port of Valdez Salmon Counts:

A total of 58,707 pink salmon, O. gorbuscha (Walbaum), were enumerated during stream surveys conducted in the Valdez area (Table 7). This total is very similar to the 59,254 salmon counted in 1973.

In the Lowe River and Mineral Creek systems (Figure 2) counts were made only in clear water tributary areas as the main stream channels contain too much glacial silt for enumeration.

Poplar Grove Creek Grayling:

The tagging study initiated in 1973 (Williams, 1974) on Poplar Grove Creek to determine migrational trends of Arctic grayling was continued in 1975. Five hundred and twenty-eight grayling, trapped during their upstream spawning migration in May, were marked with dart tags. The tagged fish ranged in fork length from 217-358 mm and averaged 274 mm. Forty-one of these fish were caught later in the season by sport anglers, along with four 1974 tagged fish, and two fish tagged in 1973 (Table 8).

Following the spawning migration into Poplar Grove Creek, most of the adults returned to the Gulkana River and tag recovery data indicate their intra-system movements were random. Tagged grayling were caught as far upstream as Paxson Lake, a distance of 79 miles (Figure 3).

Length measurements of grayling were taken at the time of tagging and also when recaptured to determine the rate of growth. These data are shown in Table 9.

Table 5. Lengths of Gulkana River Chinook Salmon, 1972-1975.

Year	1972	1973	1974	1975
Number of Fish	33	38	37	93
Length Range (mm)	770-1,160	665-1,210	650-1,222	724-1,219
Average Length (mm)	1,026	1,025	1,089	1,001

Table 6. Length-Age Data from Gulkana River Chinook Salmon, 1975.

Age	1.2	1.3	1.4
Percent of Total	3%	62%	35%
Average Length (mm)	754	919	1,105
Length Range (mm)	635-904	840-1,041	991-1,219

Table 7. Port of Valdez Salmon Counts 1971-75.

Stream	#137 Lowe River System	#137 Robe Lake System	#141 Loop Road I	#143 Siwash	#145 City Limits	#147 Mineral Creek System
Pink Salmon						
1971	13,490	4,500	875	13,040	690	1,320
1972	0	0	475	161	46	320
1973	6,549	15,000	7,000	26,770	1,700	2,235
1974	N/C	N/C	262	8	98	217
1975	15,387	2,461	5,537	33,113	1,262	947
Chum Salmon						
1971	411	P	N/C	120	2,660	1,778
1972	2,007	40	45	162	1,200	180
1973	1,063	125	N/C	232	1,812	7,111
1974	N/C	N/C	0	16	483	1,454
1975	N/C	N/C	N/C	N/C	N/C	N/C
Coho Salmon						
1971	193	9,690	N/R	57	N/R	300
1972	211	875	N/R	41	N/R	14
1973	67	4,000	N/R	6	N/R	20
1974	78	1,662	N/R	0	N/R	0
1975	1,506	1,533*	N/R	0	N/R	16
Sockeye Salmon						
1971	N/C	N/C	0	N/R	N/R	N/R
1972	27	5,000	0	N/R	N/R	N/R
1973	0	1,300	0	N/R	N/R	N/R
1974	0	3,000	0	N/R	N/R	N/R
1975	N/C	N/C	N/C	N/C	N/C	N/C

p = present, but not counted
N/C - No count taken
N/R - No Run

* 1975 S.S. counts included Robe River

Figure 2. Salmon Spawning Streams in Upper Valdez Bay.

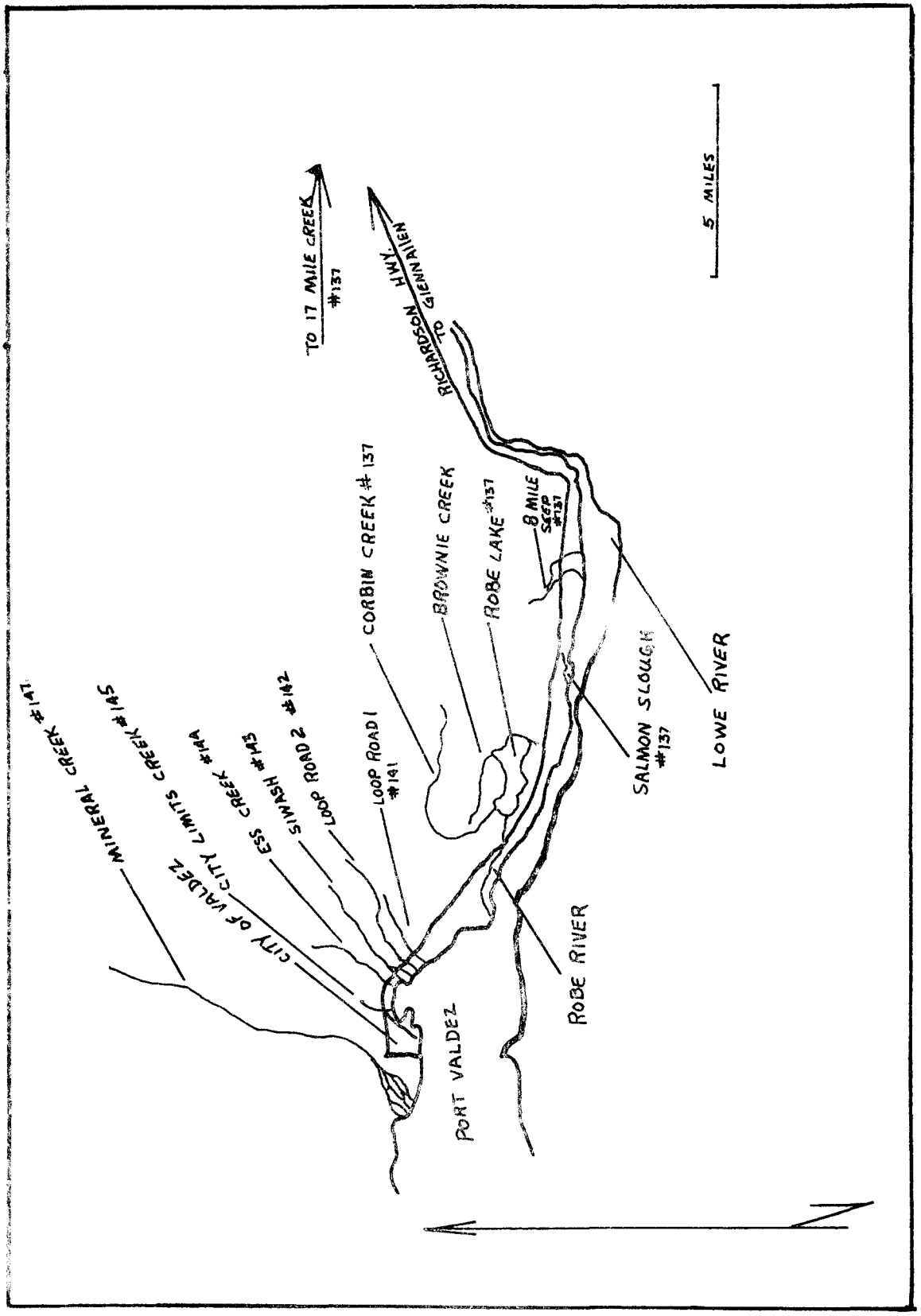


Table 8. Grayling Tag Recoveries, Poplar Grove, 1975.

Number of Fish	Date Tagged	Date Recovered	Location of Recovery*
1	5/16/73	7/ 4/75	2 miles above West Fork in main stream.
1	5/17/73	5/27/75	2 miles upstream Poplar Grove Creek at highway crossing.
1	5/15/74	5/18/75	2 miles upstream Poplar Grove Creek at highway crossing.
1	5/15/74	5/20/75	2 miles upstream Poplar Grove Creek at highway crossing.
1	6/ 4/74	5/20/75	2 miles upstream Poplar Grove Creek at highway crossing.
1	6/ 8/74	5/20/75	2 miles upstream Poplar Grove Creek at highway crossing.
1	5/15/75	5/15/75	2 miles upstream Poplar Grove Creek at highway crossing.
1	5/15/75	5/18/75	2 miles upstream Poplar Grove Creek at highway crossing.
1	5/15/75	5/20/75	2 miles upstream Poplar Grove Creek at highway crossing.
1	5/15/75	7/ 3/75	Mouth of Poplar Grove.
1	5/15/75	7/ 6/75	1 mile south of Paxson Lake, Gulkana River.
1	5/15/75	7/ 7/75	1 mile south of Paxson Lake, East Fork Gulkana River.
1	5/17/75	5/18/75	2 miles upstream Poplar Grove Creek at highway crossing.
3	5/17/75	5/20/75	2 miles upstream Poplar Grove Creek at highway crossing.
3	5/17/75	5/31/75	2 miles upstream Poplar Grove Creek at highway crossing.
1	5/17/75	6/18/75	Mouth of Sourdough Creek.
1	5/17/75	8/30/75	Outlet Paxson Lake.

Table 8.(Cont). Grayling Tag Recoveries, Poplar Grove, 1975.

Number of Fish	Date Tagged	Date Recovered	Location of Recovery*
13	5/19/75	5/20/75	2 miles upstream Poplar Grove Creek at highway crossing.
1	5/19/75	5/21/75	2 miles upstream Poplar Grove Creek at highway crossing.
1	5/19/75	5/27/75	2 miles upstream Poplar Grove Creek at highway crossing.
5	5/19/75	5/31/75	2 miles upstream Poplar Grove Creek at highway crossing.
1	5/19/75	6/11/75	Mouth of West Fork Gulkana River.
1	5/19/75	6/25/75	6 miles above Sourdough, Gulkana River.
1	5/19/75	8/31/75	Mouth Sourdough Creek.
1	5/21/75	5/27/75	2 miles upstream Poplar Grove Creek at highway crossing.
1	5/21/75	5/31/75	2 miles upstream Poplar Grove Creek at highway crossing.
1	5/21/75	6/14/75	2 miles upstream Poplar Grove Creek at highway crossing.

*Fish killed by anglers. Does not include fish passed through weir.

Figure 3. Tagged Grayling Recoveries, Poplar Grove Creek and Gulkana River. 1975.

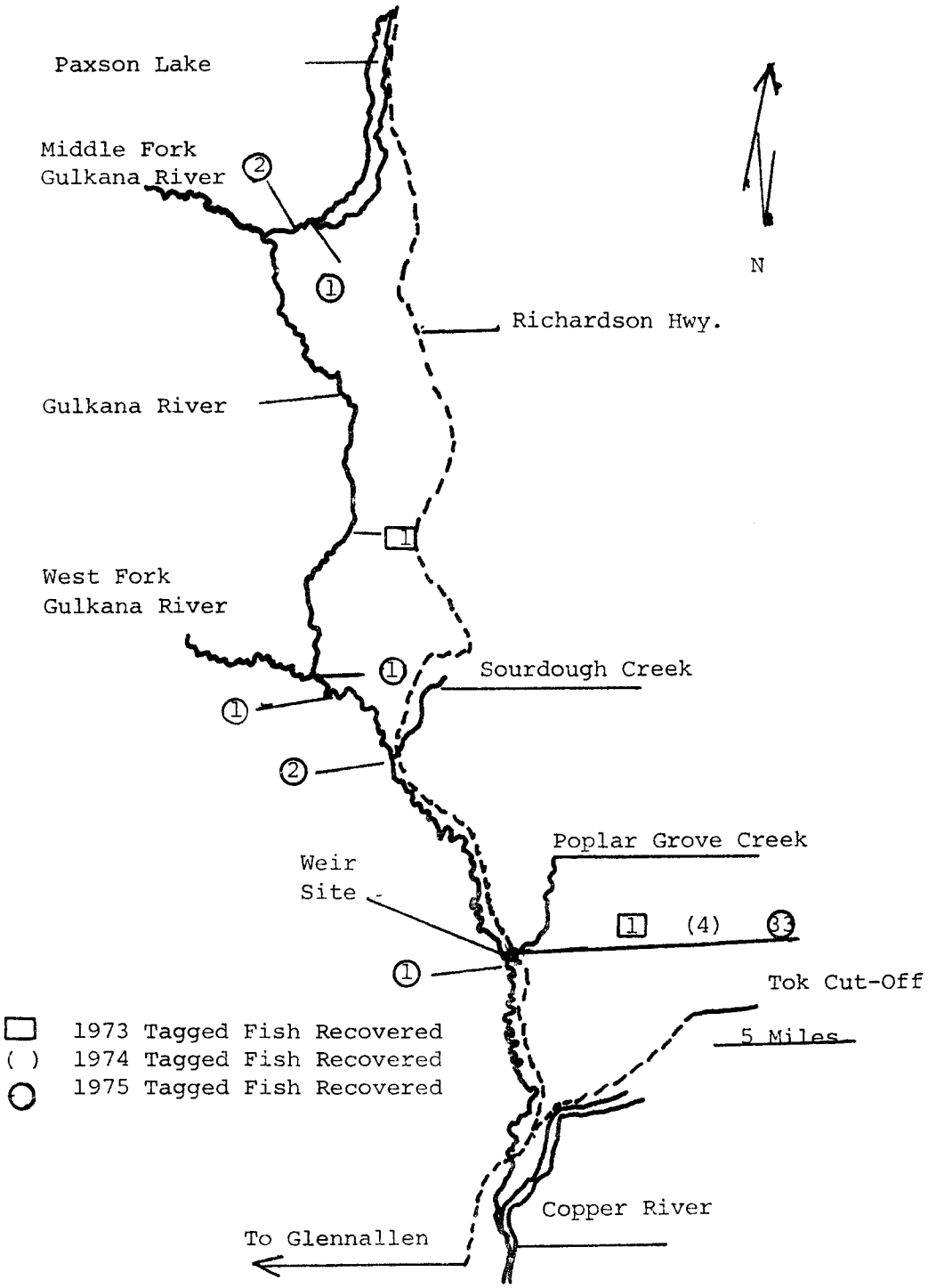


Table 9. Growth Increments of Arctic Grayling, Poplar Grove Creek, 1975.

Year Tagged	Number of Fish Tagged	Average Fork Length (mm)	Fork Length Range	Year Recovered	Number of Fish	Growth Range (mm)	Average Growth (mm)
1973	276	270	175-345	1974	13	8-55	27.6
				1975	14	7-85	44.3
1974	299	250	180-360	1975	32	3-55	27.0
1975	528	273	217-358				

One grayling, tagged in May 1973 at Poplar Grove Creek, was taken in the weir again in 1974 and 1975. It was finally caught by an angler on July 4, 1975 in the Gulkana River upstream of the mouth of the West Fork, approximately 26 miles upstream of Poplar Grove Creek.

Burbot - Hudson Lake:

During the winters of 1973-74 and 1974-75, lengths, sex, and maturity data were collected from burbot, Lota lota (linnaeus), at Hudson Lake by sport anglers. These data are presented in Table 10. One fact evident from these data is the older age of the fish. In other lakes in the area the average age of burbot taken by sport fishermen is age IV to VI, while in Hudson Lake the average fish recorded in 1975 was age VIII.

An estimated 800 burbot were harvested from Hudson Lake during each of two winter seasons. The data presented show no discernable difference in size of burbot taken in 1974 and 1975.

Outlet Structure - Tex Smith Lake:

One of the problems concerning the establishment of salmonid populations in many Alaskan roadside lakes is the presence of outlets. Coho salmon exhibit a tendency to migrate out of the lakes and downstream during their second year of life and rainbow trout sometimes migrate out for spawning purposes. Seldom do either species return to the lakes.

A standpipe structure, designed to preclude fish migration, was installed in Tex Smith Lake in 1975 (Figure 4). The structure is similar to those commonly used in farm ponds, and is designed so the top of the pipe is at, and maintains, the desired water level.

A screen cover was placed over the top of the standpipe to prevent outmigration of fish. This cover was made somewhat larger than the pipe to increase the total area of screen and reduce the possibility of plugging by debris. The screen was extended below the top of the standpipe, further reducing the amount of accumulated debris, as water can enter the screened area below the lake surface. This outlet structure was checked throughout the summer and proved to be an effective and maintenance free facility.

Habitat Protection Investigations:

Most of the monitoring of the Trans-Alaskan pipeline construction was accomplished by members of the Joint Fish and Wildlife team. However, plans for some stream crossings and pipeline related construction were reviewed. These included such things as a U. S. Coast Guard installation, additional dock construction, a sewer disposal system, and a hydroelectric plant in the Valdez area.

Preliminary plans for Alaska Department of Highways road and bridge construction at eight sites were reviewed and recommendations made for protection of the aquatic environment. Several projects in the construction stage were monitored to insure adequate fisheries protection.

Table 10. Burbot, Hudson Lake, March 1974-75.

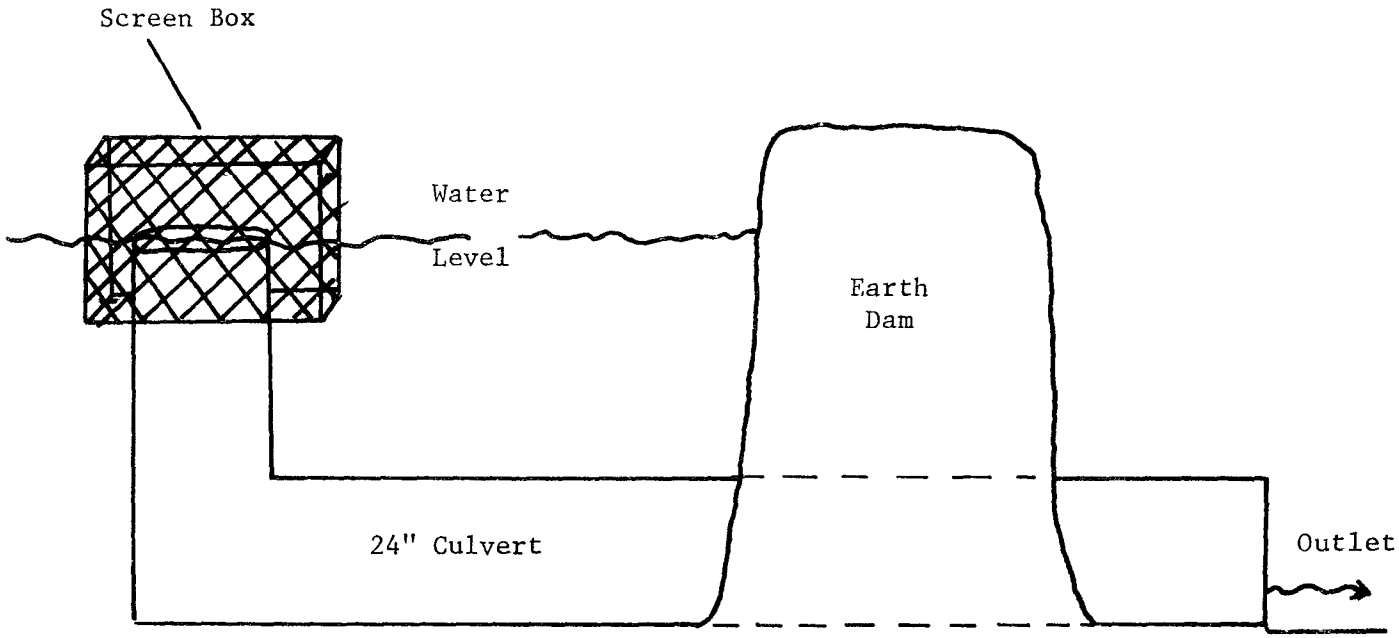
	1974*	1975**
Total Burbot Collected:	37	57
Female Burbot	21	31
Number that would spawn	12	24
Percent that would spawn this year	57%	77%
Length range	680-1,107 mm	525-940 mm
Average length	770 mm	755 mm
Age range	9-20	6-13
Average age	11.6	11
Average age ***	10.8	
Number that would not spawn	9	7
Length range	648-773 mm	545-733 mm
Average length	688 mm	640 mm
Age range	8-12	7-10
Average age	9.3	8
Average length all females	735 mm	729 mm
Male Burbot	16	26
Number that would spawn	10	23
Percent that would spawn this year	63%	88%
Length range	580-927 mm	527-826 mm
Average length	732 mm	699 mm
Age range	7-16	7-17
Average age	10.75	10
Number that would not spawn	6	3
Length range	610-790 mm	527-815 mm
Average length	693 mm	717 mm
Age range	8-12	7-14
Average age	9.0	11
Average length of all males	718 mm	700 mm
Average age of all burbot	10.6	10.2

* Fish collected from March 3 through March 23, 1974. None of the females collected during this time had spawned yet.

** Fish collected from February 22 through March 17, 1975. None of the females collected had spawned yet.

*** Age 20 fish not used in computing average age.

Figure 4. Outlet Control Structure. Tex Smith Lake.



A review was made of fishermen access needs to public waters within lands selected under the Alaska Native Claims Settlement Act. More than 60 trails were delineated and described. These data were submitted to the Habitat Section.

Discussion:

Stocked coho salmon demonstrate a tendency to migrate from stocked lakes via outlet streams during their first and second years of life.

The out-migration demonstrated in Elbow, Caribou, Peanut, and Forty Foot lakes presents a real problem to fish management, and will limit future stockings of coho in Glennallen area lakes possessing live outlet streams.

A solution to the described coho exodus appears to be the type of structure emplaced in Tex Smith Lake. Although this structure can still be described as experimental, it shows promise and warrants further evaluation under varying stream flow conditions.

Arctic grayling exhibit a greater tolerance to low winter dissolved oxygen concentrations than rainbow trout, and appear a more suitable species for introduction in lakes of the area demonstrating winter oxygen depletion.

The sport harvest of chinook and sockeye salmon from the Gulkana River was less than that of 1974 and is thought to be the result of (1) unfavorable water conditions and, (2) the effects of a regulation limiting angling to "flies only" in the lower Gulkana River area.

The goals of limiting the recreational harvest at the mouth of the Gulkana River, and of providing a greater harvest further upriver through implementation of angler gear restrictions, appear to have been successful.

Grayling tagged in Poplar Grove Creek, a tributary to the Gulkana River, exhibited a post-spawning migration from the creek to the Gulkana River. Subsequent movements and patterns of travel within the Gulkana River appeared of a random nature.

Hudson Lake, located in the Glennallen area, appears to support a mature burbot population with very little recruitment, and is currently receiving significant and increasing angler use. The continued recreational use of this species in Hudson Lake will be monitored since a unique opportunity exists to study the effects of increasing angler utilization of a mature burbot population in an interior Alaskan lake.

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